FIG. 1.

Applicant: Helen H. Hobbs et al.
Title: ABCG8 VECTORS, HOST CELLS, AND METHOD OF MAKING
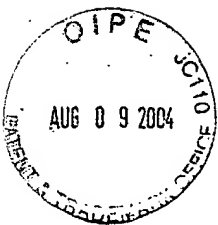Sheet 2 of 8

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ABCG5  M-------GDLSSLTPGGSMGLQVNRGSQSSLEGAPAT-APEPHSLGILHASYSUSHRVR-PW-----        54
ABCG8  MAGKAAEERGLPKGATPQDTSGLQDRLFSISESDNSLYFTYSGQPNTLEVRDLNYQVDLASQVPWFEQLAQ      70

ABCG5  ----WDITSCRQWTRQILKDVSLYVESGQIMCILGSSGSGKTTLLDAMSGRLGRAGTFL-GEVYVNGRA        119
ABCG8  FKMPWTSPSC-QNSCELGIQNLSFKVRSGQMLAIIGSSGCGRASLLDVITGR-GHGGKIKSGQIWINGQP       136

ABCG5  LRREQFQDCFSYMLQSDTLISSLTVRETHYTALLAIRRG-NPGSFQKKVEAVMAETSSHVADRLIGNY         188
ABCG8  SSPQLVRKCVAHVRQHNQLLPNLTVRETLAFIAQMRLPRTFSQAQRDKRVEDVIAELRLRQCADTRVGNM       208

ABCG5  SLGGISTGERRRVSIAAQLIQDPKVMLFDEPTTGLDCMTANQIVLLVELARRNRIVLTIHQPRSELFQ         258
ABDG8  YVRGLSGGERRRVSIGVQLIWNPGILILDEPTSGLDSFTAHNLVKTLSRLAKGNRLVLISLHQPRSDIER       278

ABCG5  LFDKIAILSFGELILCGTPAEMLDFENDCGYPCPEHSNPFDFYMDLTSVDTQSKEREIETSKRVQMIESA       328
ABCG8  LFDIVLLMTSGTPIYLGAAQHMVQYETAIGYPCRYSNPADFYVDLTSIDRRSREQELALREKAQSLAAL        348

ABCG5  YDDSA-----ICHKTIKNIERMKHLKT--IPM-----VPFKTKDSPGVFSKLGVLRRVTRNLVRNKLAV        386
ABCG8  FLEKVRDLDDFLWKAETKDLDEDTCVESSVTLDTNCLPSPTK-MPGAVQQFTTLIRRQISNDFRDLPTL        417

ABCG5  ITRLLQNLIMGLFLLFFVLRVRSNVLKGAIQDRVGLLYQFVEATPYTGMNAVNLFPVLRAVSDQESQDG        456
ABCG8  LIHGAEACIMSMTIGF--LYFGHGSIQLSFMDTAALLFMIGALIFNVILDVISKCYSERAMLYYELEDG        485

ABCG5  LYQKWQMMIAYAAHVLPFSVVATMIFSSVCYWTLGHPEVARFGYFSAALLAPHLIGELTTVLLGIVQN        526
ABCG8  LYTTGPYFFAKILGELPEHCAYIIIYGMPTYWLANLRPGLQPELLHFLLVWLVFCCRIMALAAAALLPT       555
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FIG. 1C.

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ABCG5  PNIVNSVVALLSIAGVLVGSGELRNIQEM-PIPFKIISYFTFQKYCSEIIVVNEFYGLNFTCGSSNVSVT  595
ABCG8  FHMASFFSNALYNSFYLAG-GEMINLSSLWTVB-AWISKVSELRWCFEGLMKIQFSRRTYKMPLGNLTIA   623

ABCG5  TNPMCAFTQGIQFIEKTCPGATSRFTMNFLLLYSFIPALVILGIVVFKIRDHLISR--                651
ABCG8  VS------GDKILSAMELDSYPLYAI-YLIVIGLSGGFMVLYYVSLRFIKQKPSQDW                 673
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Walker A Motif
Walker B Motif
Signature C-Motif

ABCG5 Putative Transmembrane Domain
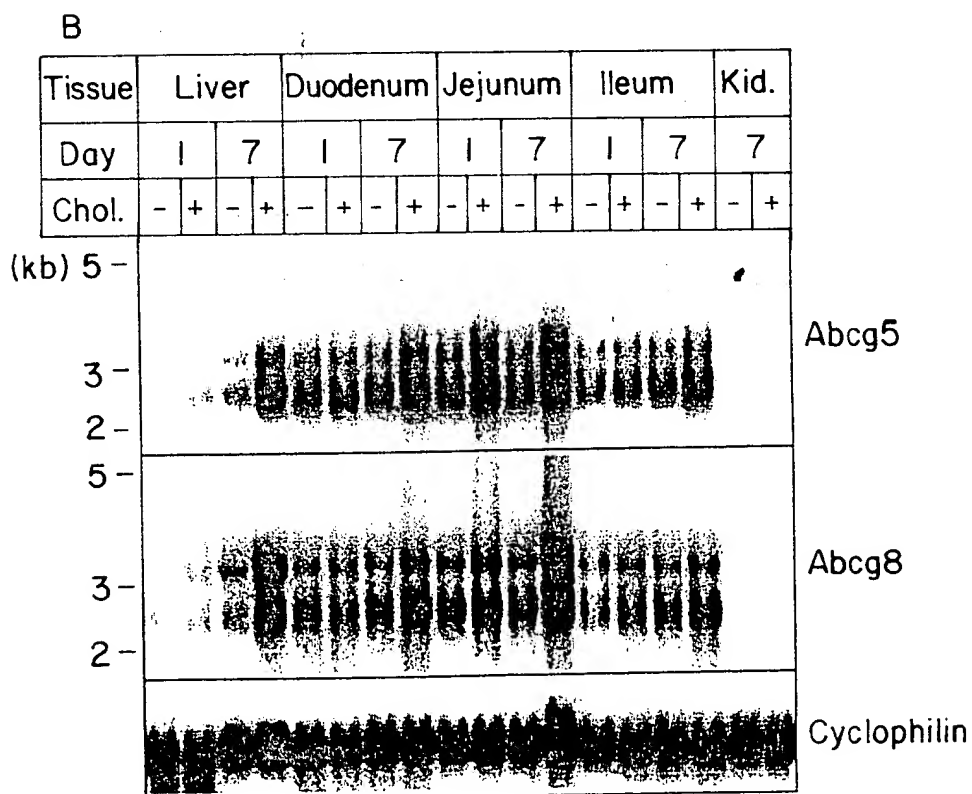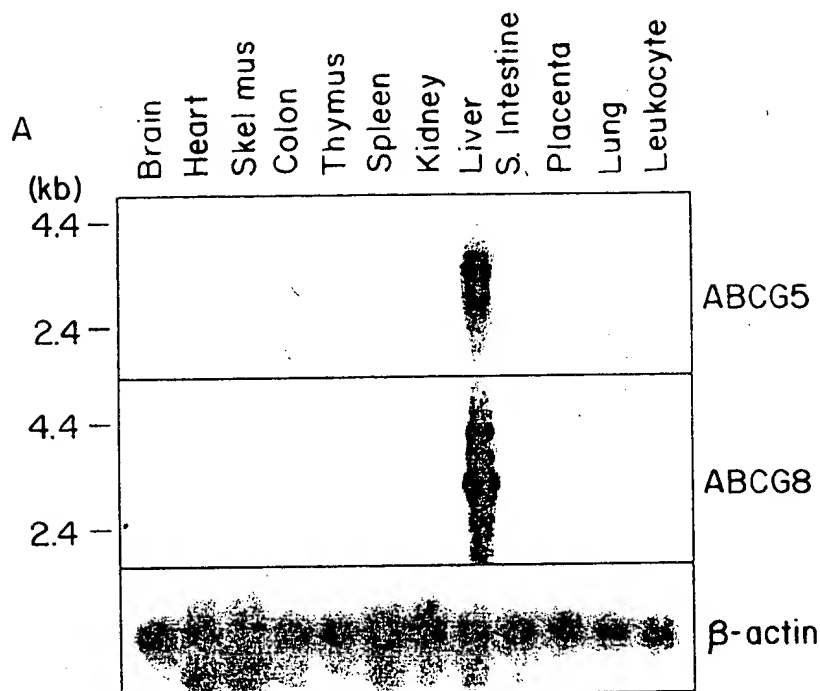ABCG8 Putative Transmembrane Domain

FIG. 1C. (CONTINUED)

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FIG. 2.

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a. *ABCG8 exon 2 (reverse strand) thru ABCG5 exon 2 (forward strand)*

aCCTGGTAGGTGAGATCTCTGACCTCCAGAGTGTTGGACTGTTGGACTGACCACTGTGTTGGACTGAAGTAGTACAGACTGTTGTCACTTTCCGAGGAGA
ACAAGCTGTCCTGGAGGCCctgctgggagacatgtagtcaatgtgtaaggtcacatgcagagagcgccttcccggttctcatt
tctttgttggaaaccatcagattcttctctccggagacttcttgcttttgaaagtaaaattttattttgtgtgtatgact
gtttgcctgcatgcgtgcgccacacatctgtgtgtgatgggaatgggtcaaaagaggtcactgggtcctctggacctgg
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cagctccattctctgatcttcttactaaaaaataataatagcaatggcttaaactatggtcaccccgctgcttcagaacactaga
atttatgtctcccatctcatttgatgcccaggatctgactgccaaccatcccctgtaataataattcatctctctgaagt
aggaatatattggagatatctttgggggtgtgtgtgttgggaatcaaatccatagc
atcaaatatactaggccaatcatgatactgacagaaccatagcaacacatccgggtccctgggttcttgtttcaaatcaat
tatctttaggagagatcttagttacttgcatgggctaggaatttgttcctagacacttgttactgatacaaagtttcttccattgg
cttcaggagtggaggggctactgaggaggaaagctctcagttactgcgctaatgtgaagacctggggggggggggttagaca
gacagagaggaggacagagtggaaggacagggatgcagttgcagtttgattagtgccagtcgcccactctgactcacaaccccactgaccccg
tccacacggagagtctgggttccaggagcctcaacagtcttctgaaaggaaaaatatatctctgtCTGGCTTG
TGGATGACTTCTGTTCCATTTAAAATATCTATTCGGCTGACACATTAATATTTCCTGGCCACCACGACTGTCAGAACATCATTGAATCTGTGACACCCTAA
AAAATTGAAAGCGGGTTTATTTGTAGGTAACTAGTGTGCTCCTCCTGGGCTACAATGTAACGTCTCCTTGTATTAACTTCTGGT
TACATTCCTGAGTCAGAAgcacagacacagacacatgggaaaatccagagggcacaaaaaggagaaatgtgcagaaaacagtggtgcctg
gtgggacatatatgtaagtcttttggcccaaggcacatacctggccctctgttgacccctcgcagacacatctcatctgcctct
gcttagagtccaggctttcctatccctgtctgcgaggagctgtagacactgggctcctggcgccctggtactcagtgccag
aattccctgtgagatagccctgatctcctccctgatctcctccaggccatcactgactgatgggtagtgtcctgtgaagacctga
ctcgaatatgagtagataaagacggtgtggccgctatgtggctggtgggtggcagagacctgtgggcagagagagatggat
ggccacggcatggagcagaagccagccagccgcagcagcctttgtgttctttgtagagtgaagaaatgctcagtttctaaattgcatcacaggacatatcagtgtctccccacccca
agccctggcagttgtcagttgcgcggccatcacaggggcacctacaacagtgggacctcacagaaggaactgtaggtggcaggacct
aggcacacttttgaatatagaattctgacagctcattgccttttgcctctttagctatctgaaggcaaaagcccaccaccccact

FIG. 3.

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FIG. 3. (CONTINUED)

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cagggcaactgggatgggtaggggctgggagcaggggtctggcacctctctgcctttgccttgtgggatt
cctttaaagCAACCGTGTCGGGCCTTGGTGGTGGAACATCAAATCATGCCAGCAGAAGTGGGACAGCAGCAAATCCTCAAAGATGTCTCC
TTGTACATCGAGAGTGGCCAGATTATGTGCATCTTAGGCAGCTCAGtaagtgcctggggggscsggggctcctgtacttctaag
gcaggctctgggaggcttggctcygtctaagcacaatgtttaagaagtragttaagttgtagagaggcagccatgcatttggc
atttgaatacaatctggtgacttgtctggctgccaatagaacctagtaccaaagtgaaatcttgaggaaaatccctgaaagagt
ggaaagtcctgcctaacacgtaagtgcctcttttgcttcttgttgactgctgatgctgtagagagcaaacccagagccttggcat
gctcagtaaaccttctgccccagcacccccaaatgtattccctccttccttccttccttcctttgtttc
tctccctttttcttttctttctatattttttcttttctttctttcttttctcacttttgcattctttctct
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gtttgattgactgtggtgtgcaggaggcctaggagagctaagacccaggtcaagttttgtcaggacttaacttc
tcgaaggccccaattctctacttttcaactgatattcccacatctgaaagtttttgtcatcagaacacagttgagaacacagtgaaagacctcatgtt
tattcctgaccctacttgtcttttcattatgatggtcatcagaacacagttgagaacacagtataccactaaaaaagacctcatgtt
aatatagtctcaccgagcacacccgtgtattcccgtgtctcttcaggagtcatcacacactgcgct
gagcccacctgtgtgtattcccgtgtctcactattctcttcaggagttaagcatcacacactgcgct
gtgttcttccactaactgtcattatcctctgagggttcctctctgcaaaacctatagctgtaaattttcctatctg
cagcagctggggagggggtacactggcccagaagagggggctctggtagcatgccgcagtgttcgcaacactgggttattctgaat
gcctctgcttaaggattctggcatatcctgcatattcgactcacagaccgttcttgactgagcagcccctgtaaactgtcagcatttaactgt
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gagtcccaa
```
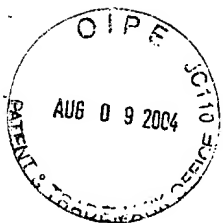
The 4 exons are underlined and the conserved regions are in uppercase. The sequence ends in intron 2 of ABCG5 and is in the following order:

ABCG8   exon 2   (reverse strand)
ABCG8   intron 1   (reverse strand)
ABCG8   exon 1   (reverse strand)

FIG. 3. (CONTINUED)

Gap between genes

ABCG5   exon 1   (forward strand)
ABCG5   intron 1 (forward strand)
ABCG5   exon 2   (forward strand)
ABCG5   intron 2 (forward strand, partial)

B. Sequence Between ABCG5 and ABCG8 Containing the Control Sequences

Gaccagtgctgtttgtgcccttgtgtggcctcccctgctgttgggctctctctgtcttgctccttagagctggggcacctgag
ccctcctgtgccagcctTTCTCCCAGCATTCCTYTCTGGCAAACACTTCCTATAAACACACCGTGTTCTGCCTATTGTCGA
GATAAGGACACTCTGGCTAAAGGTACATCAGATAAATGGCATCGTTGGCCAAattggtgaactgttatctcacgaggattccaggg
ctgggtaggatcggacaggcactcccattggctcctcagttaaagctgccctggagccgggacaggccactagaaaattcacttg
catttgcttcctgctagcc

FIG. 3. (CONTINUED)